

P. R. BROWN.
MACHINE FOR BENDING VEHICLE BOWS.
APPLICATION FILED APR. 11, 1904.

3 SHEETS—SHEET 1.

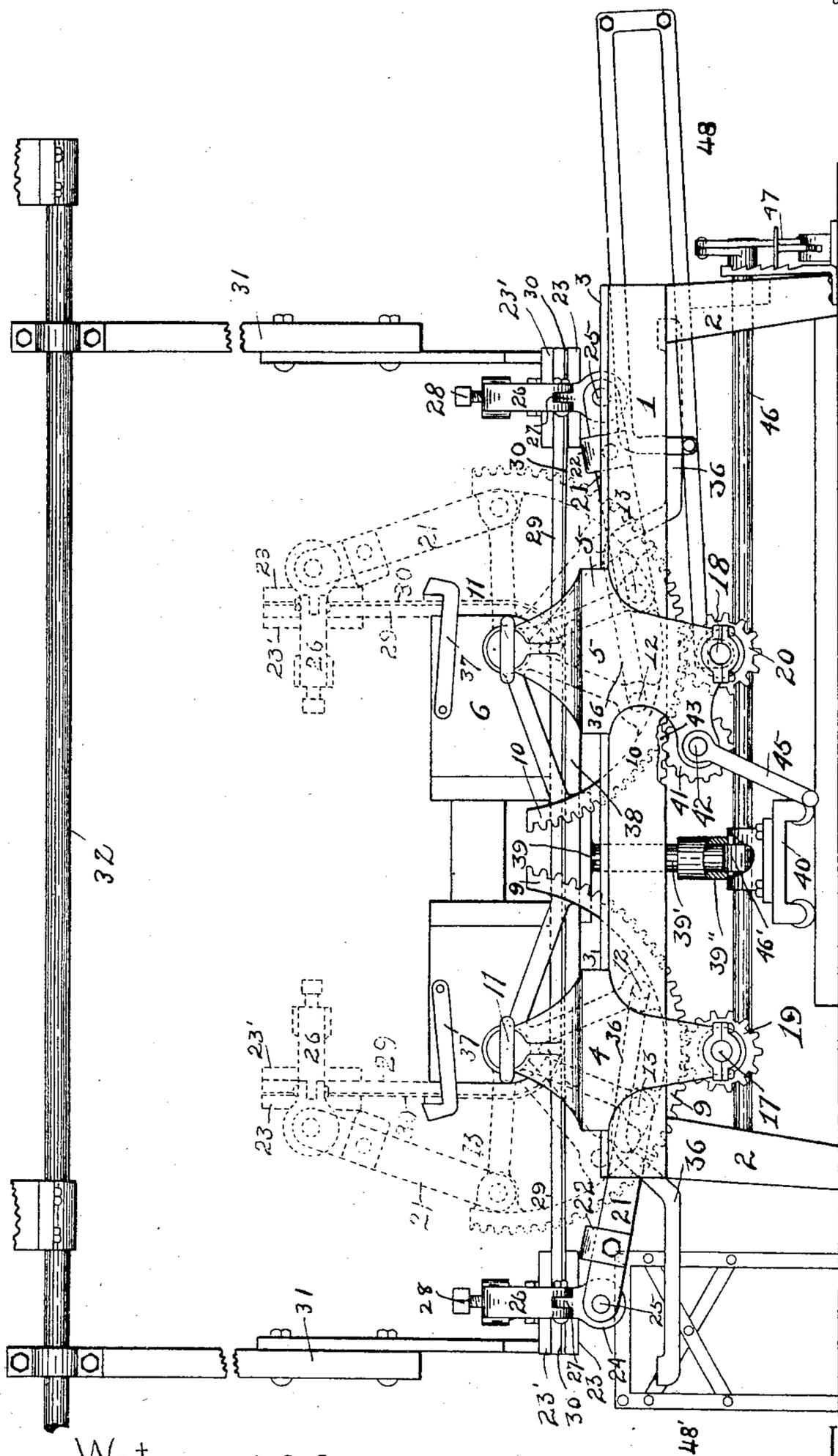


Fig. 1.

Witnesses
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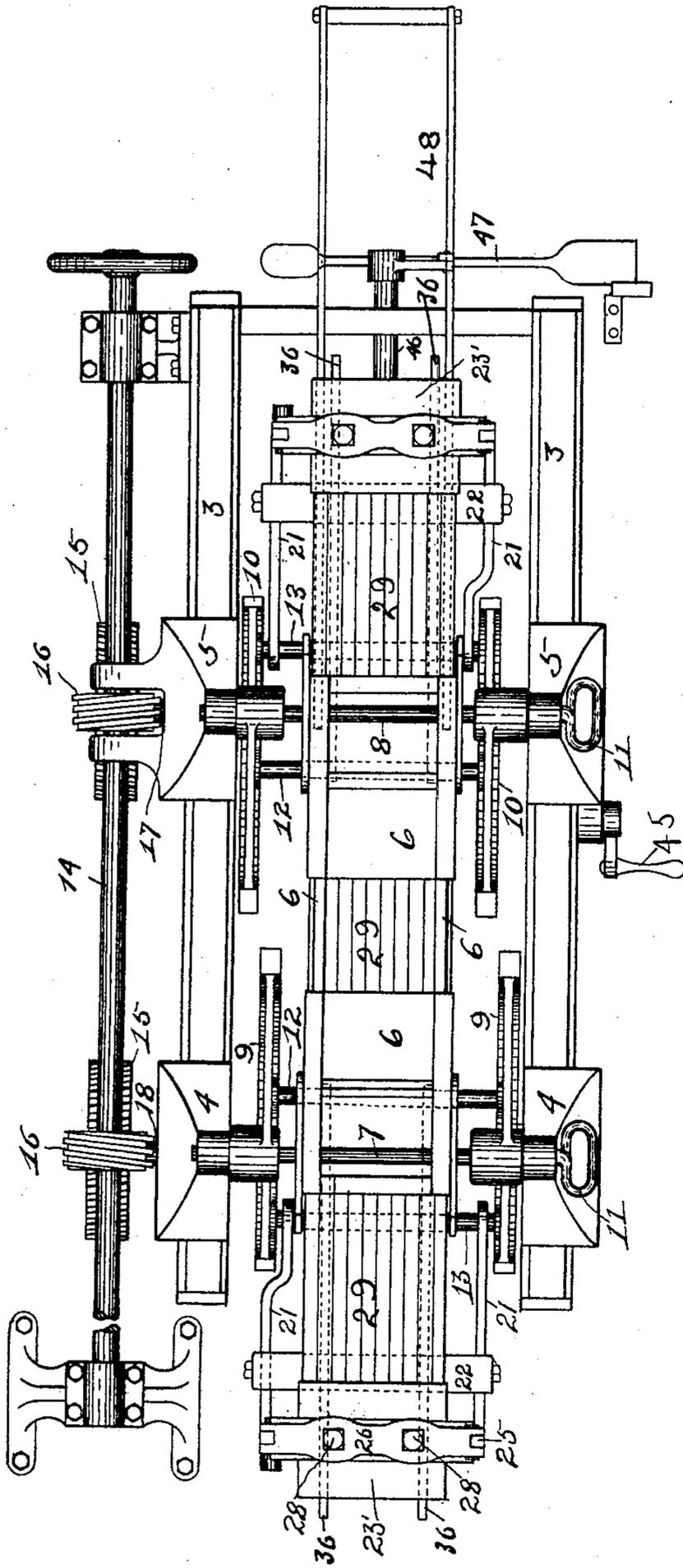


Fig. 2.

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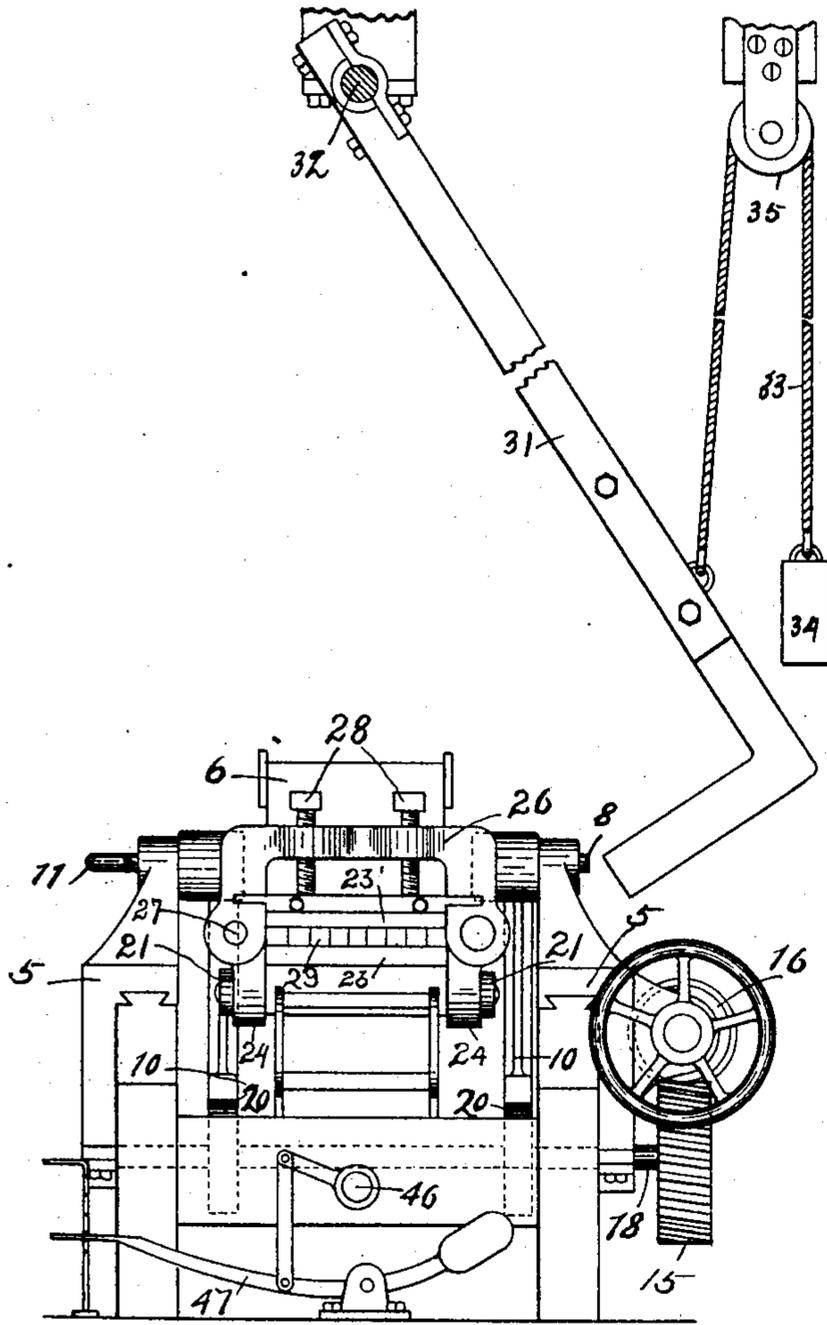


Fig. 3.

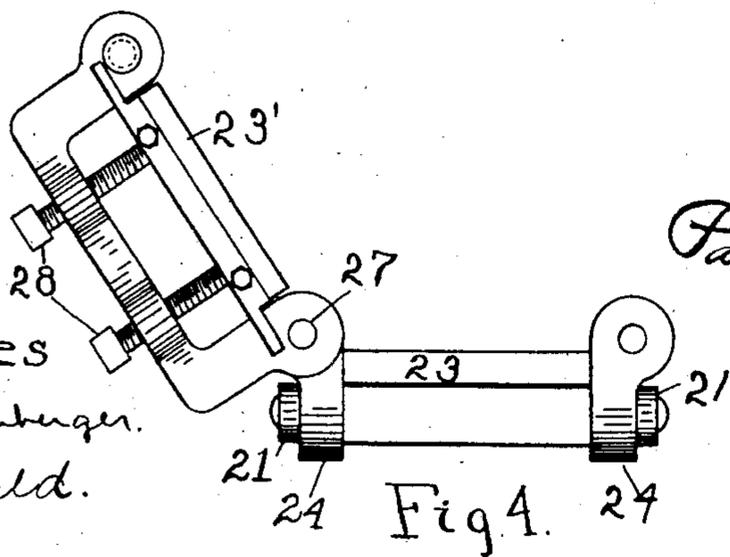


Fig. 4.

Witnesses

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UNITED STATES PATENT OFFICE.

PAUL R. BROWN, OF DAYTON, OHIO.

MACHINE FOR BENDING VEHICLE-BOWS.

SPECIFICATION forming part of Letters Patent No. 779,686, dated January 10, 1905.

Application filed April 11, 1904. Serial No. 202,625.

To all whom it may concern:

Be it known that I, PAUL R. BROWN, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Machines for Bending Vehicle-Bows; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to improvements in vehicle-bow-bending machines.

The object of the invention is to greatly increase the daily capacity of an old form of vehicle-bow-bending machine by the addition of improvements hereinafter fully described.

The improvements comprise the clamping devices and cooperating parts by means of which the stock is held while being carried around the form. Heretofore much time was lost in handling and adjusting the clamps, which rendered the machine more or less impractical.

Preceding a detail description of the invention, reference is made to the accompanying drawings, of which—

Figure 1 is a side elevation of a bending-machine possessing my improvements. Fig. 2 is a top plan view of the same. Fig. 3 is an end elevation of the same. Fig. 4 is an enlarged detached view of one of the clamps.

Throughout the specification similar reference characters indicate corresponding parts.

The table 1, which is supported on standards 2, has tracks 3, which support heads 4 4 and 5 5, the latter two heads being movable on said tracks to adjust said heads 5 5 to proper positions for various sizes or lengths of forms 6. Each pair of said heads provides bearings for removable shafts or rods 7 and 8, which enter the hubs of segment-gears 9 and 10. These shafts or rods 7 and 8 have handles 11, by which they are removed for the insertion of the former 6, the object of said shafts or rods being to provide means for holding the form in position during the bending opera-

tions. The said shafts or rods pass through the sides of the form, as shown in Fig. 2, and thence through the hubs of the segment-gears and into the bearings in the heads 4 and 5 and are withdrawn when the form is removed. The segment-gears 9 and 10 of each pair are tied together by rods 12 and 13, so that the said gears are moved uniformly.

14 designates the power-shaft, which is driven from any suitable power-generator by the usual means of belt and pulley. (Not shown.) This shaft carries two worm-wheels 16, which gear with worm-wheels 15 15 on shafts 17 and 18, and said shafts have pinions 19 and 20, which gear with the segment-gears 9 and 10, so that said segments are thus driven. On the shafts 12 and 13, which connect these segment-gears, as before stated, there are rigidly attached arms 21, said arms constituting frames which support on their outer ends the lower plates 23 of the clamps. These plates are mounted upon said arms or frames by means of bosses 24, projecting therefrom and through which rods 25 pass, said rods also passing through the ends of the arms 21. The rods 25 are loose in their attachment with said arms. There is also connected to each of the arms 21 cross-bars 22, which support the inner side of the lower plates 23 of the clamps. The upper plates 23' of the clamps are guided in yokes 26, which yokes are each connected at one end to one of the bosses 24 by a hinge-pin 27, so that the clamps may be thrown open, as shown in Fig. 4, after each bending operation. Passing through the yokes 26 are screws 28, which engage the upper plates 23' of the clamps, and thus tighten the clamps against the stock 29, said stock consisting of strips of wood which has previously been steamed. The ends of a metallic strap 30 rest upon the lower clamp members 23 in the operation of the machine, and the strips of wood or stock 29 are placed upon this strap below the form 6. The upper clamp-plates 23' are then closed or lowered on their hinges to the positions shown in the several views from that shown in Fig. 4, and an initial tightening of the clamps then takes place as follows in order that the metallic strap 30 may be stretched or straightened out to its fullest length.

31 designates two depending arms, which are hung loose upon shaft 32 and are held normally out of an operative position, as shown in Fig. 3, by means of a rope or chain connection 33, which has upon one end a weight, said ropes passing over pulleys 35. The lower ends of these arms 31 project at right angles, and the lengths of said arms are sufficient to enable the angled ends thereof to occupy a position immediately above the upper clamp-plates 23', as shown in Fig. 1, when the clamps are closed upon the ends of the stock 29. When these arms are moved in such position, the power is turned on to elevate the frames or arms 21 sufficiently to cause the lower ends of said arms to make rigid contact with the upper clamp-plates 23' and to cause a proper straightening of the metallic strap 30. At this point the screws 28 are tightened by means of a suitable wrench against the upper clamp-plates 23', and said clamps are thus made to firmly hold the ends of the stock and the metallic strap. After the clamps have thus been tightened the arms 31 are swung out to the positions shown in Fig. 3 to entirely clear the machine, and the power is again turned on to complete the movements of the segment-gears 9 and 10 to elevate the ends of the stock held in said clamps up against the ends of the form 6, as shown in Fig. 1 in dotted lines.

36 designates arms which are rigidly mounted at their inner ends on the shafts or tie-rods 12, which, as before stated, lie between the segments of each pair of segment-gears. These arms 36 serve as supports for the opened clamps as said clamps are lowered by the segment-gears after each bending operation, or, in other words, when the bending operation is completed by moving the stock and the strap to the position shown in dotted lines in Fig. 1 the form 6, together with the stock which has been bent thereon, is removed from the machine, the clamps having been first opened to permit of such removal. The return movement of the segment-gears causes a lowering of the clamps to their normal positions, as shown in Fig. 1, and during this lowering movement the arms 36 serve as supports until the lowering movements have been completed, after which said arms 36 continue to drop away from the clamps to their extreme lower positions, as shown in said figure.

The form 6 is provided on each side with hooks 37, which cooperate with another device (not shown) to hold the bent ends of the stock in position until the drying process renders said stock in a proper condition for removal from the form.

The form 6 and other devices described in connection therewith—namely, the hooks 37 and the cooperative device for holding the stock in its bent position—are old and well known and it is thought unnecessary to fur-

ther describe or illustrate the same. The form, it will be understood, occupies a position above the stock 29, the stock, together with the metallic strap 30, being placed upon a plate 38, which occupies a position approximately in the center of the machine between the heads 4 and 5. This plate 38 is supported upon a stand 39, which is on the upper end of a plunger 39'. This plunger fits in a socket member 39'', through the lower portion of which a shaft 46 passes, said shaft having a cam 46' thereon which elevates the plunger, and thereby causes the stand 39 to raise the plate 38, with the strap 30 and stock 29, firmly against the bottom of the form to hold the same rigidly. The socket 39'', through which the shaft 46 loosely passes, is supported upon a truck 40, and said stand 39 is movable to proper positions to bring it in the center of the form. The shaft 46 is turned by a foot-lever 47 to cause the cam 46' to elevate the plunger.

48 and 48' designate supporting-frames at the ends of the machine, which support the lower clamping-plates 23 when said plates are in their lowermost positions, and thus the arms 21, which primarily support said plates, are relieved of the weight thereof at such times. The frame 48' is stationary, while the frame 48 is adjustable longitudinally with the heads 5 when the machine is operating with formers of maximum width. The inner end of the frame is supported on shaft 18. The adjustment is imparted to the heads 5 by pinions 41, which are mounted upon shaft 42, the latter being journaled in the lower portion of the heads 5. The shaft 18 is also supported in said lower portion of the heads 5. The pinions 41 engage with stationary racks 43, located on each side of the machine below the sides 3 of the frame. The shaft 42 is turned to drive the pinions 41 by means of a crank 45.

The operation of the machine is briefly described as follows: The movable heads 5 having been adjusted for the proper length of form 6, the form is placed in position with the stock 29 and strap 30 below it and supported upon the plate 38 and the clamps. The upper or hinged members of the clamps are then lowered to inclose the ends of the stock, and the arms 31 are moved to perpendicular positions with the angular ends thereof immediately above the outer portion of the upper clamp-plates 23'. Power is then introduced to cause a slight elevation of the clamps, which is effectual in bringing the upper plates 23' in rigid contact with the ends of said arms. During this initial movement of the clamps it will be borne in mind that the arms 21, which support said clamps, move in an arc of a circle to some extent. Therefore the inner edges of the lower clamp-plates 23 have a tendency to tilt inwardly. This movement is arrested by the cross-bars 22. The slight arc movement thus initially imparted to the clamps

causes the strap 30 to lengthen out or stretch to its utmost length. After such initial movement is imparted to the arms 21 the clamps are firmly tightened to bind the ends of the strap and the ends of the stock by turning the screws or bolts 28, as hereinbefore stated. Power is then introduced to the segment-gears 9 and 10 to complete the elevation of the clamps through the arms 21 to bend the stock to a perpendicular position at the ends of the form 6. The stock is then secured in such position by means of the hooks 37. The clamps are then opened, the rods 7 and 8 are withdrawn, and the form removed. The power-shaft 14 is then given a reversed movement by suitable clutches (not shown) to run the segment-gears back to the positions shown in Fig. 1 to thereby lower the clamps.

Having described my invention, I claim—
 1. In a machine for bending vehicle-bows, the combination with segment-gears and means for actuating the same, of arms rigidly connected to said segment-gears, bars extending between said arms, a clamp supported upon each pair of said arms, said clamps consisting each of a lower plate which is supported upon said arms, and an upper plate which is hinged

to the first-named plate at one end, and depending arms above said clamps which make contact with the clamps in the initial movements thereof, substantially as set forth.

2. In a machine for bending vehicle-bows, the combination with segment-gears and means for actuating the same, of a frame connected to each of said segment-gears, said frame consisting of arms which are rigidly connected to the segment-gears by means of transverse rods interposed between said segment-gears, said arms being united at their outer ends by cross-bars, clamps supported on said frames and hinged thereto, arms rigidly connected to said segment-gears below the clamps for supporting the clamp-frames when the latter are being lowered, and depending arms mounted above the machine and adapted to be brought to a position to engage the clamps in the initial movement of said clamps, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

PAUL R. BROWN.

Witnesses:

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 C. M. THEOBALD.